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[54] **INTERACTIVE COMPUTER GRAPHICS DISPLAY SYSTEM PROCESSING METHOD FOR IDENTIFYING AN OPERATOR SELECTED DISPLAYED OBJECT**

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[58] **Field of Search** 364/518, 521, 522; 340/721, 723, 724, 725, 726, 727, 728, 729, 747; 382/44, 45, 46, 47, 48

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,589,289	6/1971	Gosnell et al.	101/401.1
3,715,744	2/1973	Ito et al.	340/336
3,725,563	4/1973	Woycechowsky	35/10.2
3,885,097	5/1975	Pobgee	178/18
4,112,422	9/1978	Mayer et al.	340/324
4,371,893	2/1983	Rabeisen	358/93
4,412,296	10/1983	Taylor	340/729 X
4,451,895	5/1984	Sliwkowski	364/521
4,507,523	3/1985	Gohara et al.	178/19
4,779,081	10/1988	Nakayama et al.	340/747 X
4,805,117	2/1989	Fiore et al.	364/521 X
4,811,241	3/1989	Liang	340/747 X
4,821,209	4/1989	Hempel et al.	340/747 X

OTHER PUBLICATIONS

Foley et al., *Fundamentals of Interactive Computer Graphics*, pp. 433–461, 1983.

IBM Technical Disclosure Bulletin, vol. 28, No. 8, Jan. 1986, p. 3252.

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[57] **ABSTRACT**

An interactive computer graphics display system processing method for identifying a displayed primitive that intersects an operator selected area of the display screen. Pursuant to the method, the operator selected area of the display screen is reverse mapped to world coordinate space; data representative of displayed geometric primitives is then clipped against the reverse mapped selected area in world coordinate space; and clipped data representative of displayed geometric primitives that intersect the reverse mapped selected area are identified for operator defined application processing. Further processing steps include mapping of the identified data to screen coordinate space and rasterization of the data for display in the screen monitor. A zoom processing method is also provided wherein an original operator defined zoom window is transformed from screen coordinate space to world coordinate space and the boundaries of the transformed window in world coordinate space are utilized as data clipping boundaries. After clipping, data representative of a displayed geometric primitive outside the inverse mapped zoom window is discarded, thus preventing the rerasterization of geometric primitives outside the zoom window. Further processing includes mapping of the identified data to a defined zoom window in screen coordinate space for operator viewing and selection of a particular geometric primitive for application processing.

11 Claims, 6 Drawing Sheets